

CONSERVATION AND MANAGEMENT EFFECTIVENESS OF SIMILIPAL BIOSPHERE RESERVE, ORISSA, INDIA

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Introduction

Biosphere reserve is an international designation by UNESCO for representative parts of natural and cultural landscapes extending over large area of terrestrial or coastal/marine ecosystems or a combination thereof. As a follow up of the implementation of biosphere reserve concept of the Man and Biosphere programme of UNESCO (UNESCO, 1984; 1986), Government of India initiated a centrally sponsored scheme on Biosphere Reserve in the year 1986. So far, India has 15 such reserves of which seven are included in the World Network of Biosphere Reserves and 14 more potential areas are in the pipeline to be designated as Biosphere Reserve (WII, 2009). The goals for biosphere reserve management are to facilitate conservation of representative landscapes and their immense biological diversity and cultural heritage, foster economic and human development which is culturally and ecologically sustainable, and to provide support for research, monitoring, education and information exchange (UNESCO, 1995).

Similipal Biosphere Reserve (20° 17' - 22° 34' N and 85° 40' - 87° 10'E) covers an area of 5569 sq km and is situated in the heart of the Mayurbhanj district of Orissa state in India. This reserve is one among the seven Biosphere Reserves of India that form a part of the World Network of Biosphere Reserves. The objectives of creation of this protected area (PA) are:

- To conserve the diversity and integrity of plants and animals within natural ecosystems.
- To safeguard genetic diversity of species on which their continuing evolution depends.
- To ensure sustainable use of natural resources through most appropriate technology for improvement of economic well-being of the local people.
- To provide areas for multi-faceted research and monitoring, and
- To provide facilities for education and training.

Several studies have been carried out both at national (Singh, 1999; Ganguly *et al.*, 2003) and international levels (Bruner *et al.*, 2001; Farrell and Marion, 2001; Goodman, 2003; Hockings, 2003) on the evaluation and assessment of PAs, but there is no comprehensive study that has analyzed the impacts of project inputs and the desired conservation outputs with respect to Biosphere Reserve programmes (Howard, 2006). Similipal Biosphere Reserve has been regularly receiving financial assistance from the Ministry of Environment and Forests (MoEF), Government of India, under its centrally sponsored scheme entitled "Conservation and Management of Biosphere Reserve" since its inception in 1994. However, yet we do not know whether the project inputs has actually contributed towards

achieving the stated objectives. Hence, the present study is an attempt to fulfill this gap by understanding the cause-effect relationships. The overall goal of the evaluation is to assess the extent of physical outputs and outcomes achieved *vis a vis* the envisaged ones. Thus, the main objectives of this evaluation are: (i) to assess the overall outcome and impact, (ii) to suggest improvements in the quality of implementation, and (iii) to determine continued relevance of the scheme in the context of the National Environmental Policy. Assessing management effectiveness of a PA system can enable policymakers to develop strategic, system wide responses to pervasive management problems (Ervin, 2003). Therefore, the present study is significant from the point of view of i) tracking the progress towards achieving project objectives, ii) providing timely information for decision making to improve project efficiency and effectiveness, and iii) identifying problems as they come up and before they run into crisis.

Methods and Methodology

A host of participatory evaluation methods (Burgess, 1982; Mukherjee, 1995) were administered throughout the evaluation process. This study required collection of primary as well as secondary information. While the primary data pertaining to the project activities were collected from the park management and the villagers, the secondary information was collected based on desk review of available documents. The collections of primary data involved focused group discussions, village meetings, site level observation, and evidence documentation by photography. Thus, the evaluation was based on literature consultation and review, review of management plan, monitoring reports and

research publications, discussions with field managers, staff and other stakeholders, site visits, and photography.

Site level visit was conducted during October, 2007 so as to gather first hand information about the various activities being implemented in Simlipal Biosphere Reserve and to assess the impact of these activities. During this visit, the author got acquainted with the PA managers involved in the project and the various strategies being adopted by the project officials, and shared experience with the project personnel, the local communities and the NGOs. Discussions were held with the Field Director of Simlipal Tiger Reserve, Divisional Forest Officers of the Baripada, Rairangpur and Karanjia Forest Divisions, and other staff of the PA. The management plan, village micro plans, working plans, APOs and other relevant research information related to the site were reviewed. Visits were planned to cover a cross section of the core, buffer and transitional zones of the Biosphere Reserve where different components of the Biosphere Reserve scheme such as protection, eco restoration, conservation awareness and extension, eco-development and ecotourism activities are being implemented.

During this field visit the author met villagers, Ecodevelopment Committee (EDC) and *Vana Surakhya Samiti* (VSS) executive members, members of women Self Help Groups (SHGs), *Vaidya Sangha* (Traditional Healers) and *Sabuja Bahini* (Green Brigade), and had discussions with them about the protection aspects and alternate income generation activities being promoted through the scheme, short fall if any, and the sustainability of the program. During this visit he had also witnessed a veterinary care health

camp and meetings held by the members of some women SHGs. He met the local NGOs and held discussions with them for getting their impressions about performances of various activities undertaken in this project.

Since Simlipal received financial assistance under various centrally sponsored schemes, the impacts of various activities implemented under the Biosphere Reserve scheme can not be seen in isolation. For example, fund received and expenditure incurred under the Biosphere Reserve programme is only a part of the total (Table 1) and therefore it is not only difficult but also practically impossible to separate the outcomes of protection effort done under the Project Tiger and Biosphere reserve schemes. Thus, what is seen at the end is the cumulative impact of money spent under different components of various parallel programs being implemented. Hence, during the current assignment, only the overall outcomes were assessed.

The overall performance of the Biosphere reserve scheme was evaluated based on scoring a number of parameters such as attainment of objectives, achievements of outputs and activities, implementation approach and quality, stakeholder participation, livelihood and community welfare, education and awareness generation, research management interface, inter sectoral coordination, and program sustainability on a scale of 10 points ranging from 'highly unsatisfactory = 1' to 'highly satisfactory = 10', and finally calculating the overall rating.

Study Area Description

Simlipal exhibits a great degree of topographic variations, and thus provides abode for rich biodiversity. The climate is warm and humid with an average annual rainfall of 173

cm (maximum 225 cm and minimum 110 cm), and the maximum temperature during the hot weather rises up to 43 °C while the minimum, during winter falls as low as 4 °C.

Simlipal is composed of 6 main types of vegetation such as northern tropical semi evergreen forests, northern tropical moist deciduous forests, dry deciduous hill forests, high level Sal forest, grassland and savannah (Champion and Seth, 1968). This area is the abode of 1076 species of vascular plants representing 168 families of which 64 species are cultivated plants and 94 are orchids (Saxena and Brahmam, 1989). The Gymnosperms are represented by only 2 species. The Pteridophytes include 60 species of ferns and fern allies. Of the total number of plant species found here, 2 species of orchids are endemic, 8 plant species are endangered, 8 species are vulnerable, and 34 species are rare (Mishra, 1997). The percentage ratio of dicotyledonous and monocotyledonous species in the flora of Simlipal is 71.5: 28.5 as against 81.3:18.7 in the world flora showing much higher percentage of monocotyledonous plants. There are 552 species of medicinal plants listed in the flora of Simlipal of which the commercially important ones having potentiality for commercial exploitation are 73 in numbers (Pandey *et al.*, 2000). These species are used by a number of pharmacies for the manufacture of a number of compounds used in *ayurvedic* and pharmaceutical preparations. It is believed that many species of medicinal plants are yet to be explored and thus, this reserve provides opportunities for gene pool conservation and biotechnological research in future. The discovery of new species of paddy and identification of over 500 varieties makes Simlipal a paradise for scientific studies on biodiversity. Like the floral diversity, faunal

diversity of Simlipal is also very rich. There are 42 species of major mammals, 242 species of birds and 30 species of reptiles recorded so far in this reserve. Tiger, panther, elephant, gaur, and four horned antelope, etc. are found in different levels of abundance. Ratel, pangolin, giant squirrel, sambar and cheetal are among the other few worth mentioning animal species. This reserve is credited to have 7% reptiles, 20% birds and 11% mammals of the Indian checklist.

Similipal is inhabited by a number of aboriginal tribes. The chief ones among them are Santal, Kolha, Bhomij, Bhuiyan, Bathudi, Kharia, Gond, Mankadias, Pauri-Bhyuyan, Mahalis, Sounti, and Saharas. Some of these tribes, namely Karias, Mankadias and Saharas are still in the primitive state of living. They depend solely on their surrounding forests for most of their requirements from food to medicine.

In India, Biosphere Reserve is not a legal conservation category unlike Wildlife Sanctuary and National Park, but areas earmarked as Biosphere Reserve often overlap with areas which are legally protected. The different zones of the Simlipal Biosphere Reserve (Fig. 1) and their current management status are as follows:

Core Zone: The entire Core zone of 845 km² was being managed as a sanctuary from 1979. This area was subsequently declared as National Park in two phases during 1980 and 1986. As this zone contain suitable habitat for numerous plant and animal species, including higher order predators such as tiger and also contain centers of endemism, it is kept absolutely undisturbed. This area is known to conserve the wild relatives of many economic species and thus represent important genetic

reservoirs. Therefore, this zone secures legal protection under the Wildlife (Protection) Act, 1972 and research activities that do not affect natural processes and wildlife are only allowed.

Buffer Zone: The total area of Buffer Zone is 2129 km² comprising of 1905 km² of sanctuary and 224 km² of reserve forests. Buffer zone surrounds the core zone, and the human uses and activities are managed in ways that protect the core zone. These uses and activities include eco restoration, demonstration sites for enhancing value addition to the resources, limited recreation, tourism, fishing and grazing, which are permitted to reduce its effect on the core zone. Research and educational activities are also encouraged here. Scattered within the buffer zone are 61 villages.

Transitional Zone: The total area of Transitional Zone is 2595 km². This is the outermost zone of the Similipal Biosphere Reserve comprising of settlements and a variety of crop lands, managed forests, areas of intensive recreation and other economic uses characteristics of the region wherein the local communities, PA managers, scientists, and other stakeholders work together for achieving the broader objectives of sustainable development. That is why this zone is termed as the zone of cooperation. There are 1200 villages in this zone whose total population is approximately 0.45 million. The tribal constitute about 73% of this population. The total length of the outer most boundary of the Biosphere Reserve is approximately 600 kilometers.

Management Issues

Major management problems arise from *Akhand Shikar* (mass hunting of animals as a ritual), poaching and timber smuggling, NTFPs collection, forest fires, encroachment, human

settlements in core, grazing by domestic livestock.

Inputs in Simlipal Biosphere Reserve

Financial Investments, Planning and Management

An amount of Rs. 36.45 million was spent during the year 1994 to 2007 to carry out the activities envisaged in the Management Action Plan, which approximately comes to about Rs. 3 million per annum. Fund flow was driven by annual plans and there were no long term planning for the project site. Though the state government has been able to prepare and submit the annual plans to Government of India regularly, there has been problem of late receipt of funds for the field implementation. There have been instances particularly in the initial stages of the programme that the allotments of Government of India could not be received. In some years due to late receipt of funds, there has been revalidation of the previous year's allotments, thereby affecting the timely implementation of the seasonal activities. Also the actual funding received under the scheme is not seen commiserating with the proposals submitted by the State Government. Due to uncertainty of the extent of funds likely to be available for the project site, the management could not prioritize the inputs for different type of activities. This has compromised on the likely impact and outcome of the programme. Uncertainty about the quantum and timely release of funding has particularly affected the level of success of participatory programmes.

Implementation Approach

Implementation of various activities of the Biosphere Reserve programme was done through already existing as well as newly formed institutions, empowering the partners

by training and capacity building programmes, and establishing a co ordination mechanism for the overall supervision. While doing so, the guidelines issued by Government of India and State Government have been scrupulously followed by the executing agencies. While carrying out the activities, the provisions of Wildlife Protection Act (1972) have also been followed strictly.

Institution building

A. Co ordination Committees

Three coordination committees namely the State level Steering Committee, Local level Co ordination Committee, and the Research Committee has been set up for the overall supervision and monitoring of the implementation of the Biosphere Reserve Programme at Simlipal, and also to monitor the progress towards achieving the set objectives. The state level steering committee is headed by the *Chief Secretary of the State* to oversee the programme. It has wide representation from various line departments of the State and Central Government, scientists with requisite expertise, representatives of designated 'Lead Centre' (Research Institution) and representative of Union Ministry of Environment and Forests. This committee critically examines the Management Action Plans (MAPs) and makes appropriate recommendations to the Central Government about the activities to be undertaken and the finance matters. Thus, the main responsibility of this committee is advisory. The meeting generally takes place annually once.

Local level Co ordination Committee is headed by the Project Director, Simlipal Biosphere Reserve who co-ordinates activities of three Forest Divisions, various district level line departments, and recommends suitable

management interventions for incorporation in the Management Action Plan. Since this PA receives funds under various centrally sponsored schemes such as development of National Parks and Sanctuaries, Tiger Project, Project Elephant, etc., this committee scrupulously recommends appropriate activity under this programme to avoid duplication. Therefore, being the Chairman of this committee, the Project Director critically examines and ensures that in the event of a given component being funded from more than one source, the territorial/geographical locations are different and clearly delineated so that there is no duplication. Meetings of this committee are held twice in a year.

Research Committee is headed by the Chief Wildlife Warden of the concerned state. The other members are Director, Botanical Survey of India, Zoological Survey of India, representative of local University, Director, Wildlife Institute of India, Field Director, Project Tiger. The meeting is held annually and comes out with identified research proposals to help management of the Biosphere Reserve.

B. Village level Institutions

Institution building at the grass root level was the most important aspect for sustainability of Biosphere programme at Simlipal. This was a long stretched concurrent activity through out the project period involving a series of meetings and awareness workshops. Participatory tools were used to identify the existing institutions in different villages and Ecodevelopment Committee (EDC), Self Help Group (SHG), *Vaidya Sangha* (Committee of Traditional Healers), *Vana Surakhya Samiti* (VSS-Forest Protection Committees), and *Sabuja Vahini* (Green Brigades) were constituted through dialogue, participatory assessment, consensus

building and drawing strength from available institutions. While the *Sabuja Vahini* and VSS were formed primarily for helping the PA management in protection work, the EDC and SHG were formed for implementing community welfare and alternate income generation activities. However, the *Vaidya Sangha* has been formed with the dual objectives of promoting local health traditions and conservation of medicinal plants. Volunteers of the *Sabuja Bahini* were provided with photo identity card, uniform, whistle, torch, and incentives for patrolling and information giving. Seed money for revolving fund was provided to some EDC and SHGs for starting alternate income generation activities. Table 2 shows the number of such village institutions formed around Simlipal Biosphere Reserve and their specific mandates for implementation of various activities.

Capacity Building of Staff and Community

Field staff and local people were the key actors in this project. The PA staffs responsible for translating the management policies into action have traditionally been competent in activities related to PA protection, habitat management, eco-restoration work. They may have some idea about the village communities and their resource dependencies. But their overall sensitization towards park-people issues and skills to deal with these issues still remain a weak area. Similarly, the local community may be very rich with respect to their traditional knowledge. But there is still a lot of scope to upgrade the understanding of the local communities about latest issues and happenings in the area of conservation and development. They may also not be aware about the available opportunities for their local development as well as access to these opportunities. of late, due to socio-political

factors and the impact of market forces, village communities have become highly disorganized and divided and their traditional institutional structures have become almost crumpled. Most of the NGOs are also quite active and competent in human development issues. But only a few NGOs are well organized to take up the new responsibility of undertaking PA conservation-development initiatives. Therefore, capacity building and empowerment of all these three critical actors was very important for such a programme that focused primarily on the twin objectives of conservation of biodiversity and compatible conservation friendly local development. Keeping these realities in mind, this particular component of the project was given a major focus throughout the biosphere programme.

For certain specific trainings, services of specialized individuals/organizations including that of the local NGOs were also made use of. This was particularly required for skill development among the frontline staff and selected community representatives in some employment generation opportunities, primary health and veterinary care, and awareness generation among villagers.

Planning Process

A. Reserve and PA level Planning

The Management Action Plan for the Biosphere Reserve for the period 1994-2006 envisaged the followings:

- Habitat survey, identification of sensitive areas for immediate action, preparation of micro plans, biodiversity monitoring, monitoring of meteorological data, soil and water;
- Eco restoration through participatory management which include

identification of areas, soil and moisture conservation, pasture development, afforestation activities, development of nurseries, training and orientation of staff, training of communities, motivation of villagers for an improved participation in biosphere reserve conservation; and

- Ecodevelopment activities to provide alternative livelihoods to local communities.

Accordingly, outputs and activities were planned and got implemented. Core area, however, was managed as per the approved management plan of the Simlipal Tiger Reserve.

B. Village level Planning

Training of selected staff and community representatives on issues related to participatory tools and techniques and the skills of micro planning by a specialized NGO became the precursor for micro planning process. Exclusively trained micro planning teams for different village clusters undertook exhaustive Participatory Rural Appraisals (PRA) to gather base line information and prepared micro plans for 20 selected villages (8 in Baripada, 8 in Karanjia and 4 in Rairangpur Division) with active involvement and participation of the village eco-development committees. The project team and the NGO provided back support to these teams throughout the micro planning exercise. The implementation of eco-development micro plans was done in the light of Orissa Government resolution and rules there in. Constitution of eco-development committees, selection of trust building activities, and prioritization of activities for micro plan implementation were all done through

consensus evolved by involving the local communities and the staff.

Co-ordination mechanism and partnership with other stakeholders

Dovetailing of the programmes, and pooling of expertise and resources of other stakeholders working in this area for achieving the broader objectives of conservation and sustainable development became one of the most important, but difficult aspect of Biosphere Reserve programme. This was attempted after the village level institutions started functioning. In the beginning, few partners working in the area were identified and efforts were made to integrate their activities with those of the project. Through a stakeholder consultation process, a coordination mechanism for conservation development initiatives for the reserve was evolved and got vetted through the PA level Co ordination Committee. This led to the promotion of very specialized programmes such as vermi composting, local health traditions, herbal home garden, extraction and preparation of traditional herbal medicines, etc. in the area.

Physical Activities, Overall Outcome and Impacts

Activities implemented in Simlipal towards achieving the broader objectives of Biosphere Reserve Programme can broadly be classified as protection, eco restoration, ecocodevelopment, conservation awareness, and research and monitoring. The current management interventions to address the critical management issues, overall outcome and required corrective measures have been listed in Table 3. The overall outcome and impacts of the project had been both in quantitative and qualitative terms. Major

outputs as per the project objectives are improved protection, ecological restoration of degraded forests, sustainable utilization of natural resource, better employment opportunities, increased conservation awareness and PA-People relationship. The qualitative outputs have generated the overall atmosphere for stakeholder's participation, women empowerment and sustainable development initiatives in the villages of Simlipal Biosphere Reserve.

Quantitative Change

The broader objective of biodiversity conservation can not be achieved unless the damaged habitat is repaired and biotic pressure is reduced. For reducing the biotic pressure protection has to be strengthened, and at the same time the dependency of local people upon the PA forests has to be reduced. An effort to re vegetate the degraded forests in Simlipal with the help of local communities is quite evident. There is also plenty of evidence suggesting an improved protection. Crystal clear evidence in favor of this is the complete halt of *Akhand Shikar* (mass hunting) in Simlipal since 2005. This was the result of deployment of a strong and committed protection force comprising of Ex-army personals and *Sabuja Vahini* volunteers. In December 2005, forest department staff with the help of Ex-army personnel and *Sabuja Vahini* volunteers, arrested 238 persons and seized 24 guns, 118 bows, 470 arrows and 6 axes. This incidence has tremendous impact on the people around Simlipal and since then a single case of *Akhand Shikar* has not occurred even during the peak of the season of April-May, 2006 onwards.

Illegal cutting of trees and cases of forest fires has also been reduced considerably as the VSS, EDCs, and Green Brigades volunteers are

actively involved in forest protection and strengthening the intelligence network. An analysis of the offence records and incidences of forest fires during 2006-07 and 07-08 (Table 4) indicates the commitments of *Sabuja Vahini* in detecting forest offences as well as forest fires. Of the total offence cases recorded in the Project Tiger area which corresponds to the core zone of Simlipal Biosphere Reserve, 79 % were detected by the *Sabuja Vahini* volunteers alone. Likewise, they have detected 215 cases of forest fires (Table 4). Involvement of local people in intelligence gathering is also quite commendable. Forest cover in general has improved as well as the poaching of animal has decreased drastically indicating an improvement of the general health of the forest ecosystem.

Qualitative Changes

A number of impacts that cannot be documented in quantitative terms can be seen because of the project initiatives. To capture these impacts we may need further scientific investigation. However, during the meetings and interactions with the staff, community, and local NGOs, the following qualitative impacts were quite evident and thus documented.

Conflict Mitigation

A rapid conflict mapping exercise with the various stakeholders revealed that the conflicts between the PA management and local people of the project area have considerably reduced. Likewise, the conflicts between the PA management and other stakeholders like NGOs as well as media have reduced to a greater extent. This is however a very superficial picture of the change that has occurred in the extent and intensity of conflict during the tenure of this project. However, for

detailed analysis, a short study will be necessary.

Change in Attitudes

One of the most important contributions of this project has been a drastic change in the attitudes of staff towards the people's issue and that of the communities towards the staff and conservation issues of Simlipal. At present, there is at least a pool of staff in Simlipal who are much more sensitive to the issue of park-people interface situation, and their current management actions are much more effective as compared to before. The local communities in the areas where ecodevelopment committee, *Sabuja Vahini* and VSS are functioning are directly or indirectly helping in habitat protection work and detection as well as passing on information about illegal activities. However, much still depends upon the attitude and capability of the local staff of the area to extract the help of the local villagers for PA protection, making use of the goodwill generated through the project implementation. Thus, now there are new partners in the project and they have become much more sensitive towards the conservation issues through their involvement with the project team.

Better Awareness

A beginning in this direction has been made through nature awareness campaign and eco club programmes organized by the department as well as the NGO partners. The project staffs, through institutional building process, have further strengthened this. Local people and school children of villages, where the project has been implemented, are much more sensitive to the conservation issues of Simlipal as compared to the earlier situation.

Table 1

Expenditure statement of Baripada Forest Division under different centrally sponsored schemes

Sl. No.	Scheme	Total expenditure during 04-05, 05-06, and 06-07 (Rs)	% of Total
1.	Project Elephant	1130,200	9.5
2.	Biosphere Reserve	5458,250	45.8
3.	Tiger Reserve	5321,650	44.7
Total:		Rs. 11910,100	100

Table 2

Village institutions formed around Simlipal Biosphere Reserve

Sl. No.	Village Institutions	Number formed	Mandate
1	<i>Sabuja Bahini</i> (Green Brigade)	57 (496)	Protection of forests and wildlife
2	<i>Vana Surakhya Samiti</i> (VSS)	681	Protection of forests and wildlife
3	Ecodevelopment Committee (EDC)	150	Village eco development
4	Self Help Group (SHG)	273	Provide alternate employment opportunity
5	<i>Vaidya Sangha</i> (Committee of Traditional Healers)	3 (65 +)	Promote local health traditions Conservation of medicinal plants

Value in the parenthesis refer to the total number of volunteers/members

Table 3*Present management interventions, overall outcome and desired interventions*

Present management interventions	Overall outcome and corrective measures
<p>Planning and implementation:</p> <ul style="list-style-type: none"> • Management action plan (1994-2006) and annual plans in place • Implementation was done through: <ul style="list-style-type: none"> ▶ Already existing and newly formed institutions ▶ Empowering the partners by training and capacity building programmes ▶ Establishing a coordination mechanism for the overall supervision • Financial investments: Rs. 3,64,57,000/ spent during the year 1994 to 2007 to carry out the activities (Rs. 30,00,000 per annum) <p>Protection:</p> <ul style="list-style-type: none"> • Formation of Protection Force against Akhand Shikar and timber theft (special anti poaching and forest protection squad comprising of 54 Ex-army personnel and 100 Green Brigade volunteers) • Construction and maintenance of anti poaching camps • Monsoon patrolling • Preparation and implementation of fire management plans, fire preventions with the help of village institutions • Proper demarcation of boundaries of the different zones <p>Eco restoration:</p> <ul style="list-style-type: none"> • Identification of critical areas for habitat improvement and eco restoration activities • Soil and moisture conservation measures • Pasture development • Afforestation activities with development of nurseries and cultivation of horticultural and commercially viable forest species • Training and cross learning camps at community level • Motivation of villagers for an improved participation in biosphere reserve activities <p>Eco development:</p> <ul style="list-style-type: none"> • Promoting improved agricultural and animal husbandry practice 	<p>Planning and implementation:</p> <ul style="list-style-type: none"> • Program implemented broadly are protection, eco restoration, ecodevelopment, conservation awareness, research and monitoring • Formation of 57 Green Brigades, 150 EDCs, 681 VSS, 273 SHGs, 3 <i>Vaidya Sangha</i>, and 3 co ordination committees • Need of 5 year perspective planning using log frame approach and involving various stakeholders • Perspective plan can flow into the annual plans for ensuring continuity of management inputs • Fund flow was inadequate and delayed, reasons of which needs further scrutiny • There should be a long term commitment for providing timely and adequate funds • Need of decentralized mechanisms of fund generation and management such as FDA approach and creation of some corporate fund in the line of Periyar Foundation <p>Protection:</p> <ul style="list-style-type: none"> • Protection have been strengthened significantly by <ul style="list-style-type: none"> ▶ Complete halt of Akhand Shikar ▶ Drastic reduction in timber theft and NWFPs collection ▶ Control of encroachment and forest fires • Protection should get continued funding support through the biosphere reserve scheme <p>Eco restoration:</p> <ul style="list-style-type: none"> • Various activities implemented for eco restoration was satisfactory • Expenditure incurred was quite reasonable, but low level of funding and delay in fund flow was a critical impediment for implementing this popular activity in large scale • Eco restoration works need to be extended to more areas <p>Eco development:</p> <ul style="list-style-type: none"> • Various activities implemented under eco development was satisfactory

contd...

- Supply of alternate fuel and energy saving devices
- Providing alternate income generation packages for livelihood support and micro finance to SHGs and EDCs for small enterprises
- Community development/ welfare work (Water harvesting structure, health and veterinary care) as entry point activities
- Training and cross learning camps at community level

Education and awareness:

- Organization of nature and wildlife awareness camps, campaign against *Akhand Shikar*, orientation programme for ecotourism activities
- Construction of nature trails and interpretive facilities (Astral garden, wayside exhibits and signage)
- Publication of interpretive materials such as posters, guide books, audio visual aids
- Development of reference library and field research centers at Ramthirtha and Udala
- Dissemination of gathered technical knowledge and research findings (research seminar)

Research and monitoring:

- Regional Plant Research Center (RPRC), Bhubaneswar is the nodal agency for carrying out and facilitating research funded by the MoEF
- This reserve received funding support for 19 major research projects (11 completed and 8 ongoing) covering diverse subject areas
- A number of research institutions and individuals have also contributed for research in different aspects ranging from base-line surveys to ethno biology, through animal – habitat interactions, wildlife techniques, and finally extending to socio-economic studies

Co ordination mechanism:

- State, PA, and local level co ordination committees are in place for planning and implementation of various activities under the biosphere reserve scheme
- Significant measures have been taken to avoid duplication of work as the money comes from a number of centrally sponsored schemes other than biosphere reserve scheme

- Water harvesting structures, medical and veterinary camps organized in fringe villages had wide acceptance
- Introduction of alternate fuel and energy saving devices should be extended to more areas
- Diversify supplementary livelihood activities after site specific situation analysis
- Not much initiative towards promoting enterprise development, value addition and proper market linkages of the products

Education and awareness:

- Support provided under biosphere reserve scheme has facilitated and helped significantly in the area of nature awareness campaign, eco club programs and trainings
- But there is no interpretation center as such in the PA.
- The current interpretive facilities such as way side signage and exhibits in Ramthirtha tourism complex and Jashipur are poor
- Current efforts towards strengthening the existing infrastructure and interpretive facility with the help of experts from the Center for Environment Education, Ahmedabad should be supported through funding from continued biosphere reserve scheme

Research and monitoring:

- Regular interactions between the managers and the scientists have helped in shaping the research agenda to make it more management oriented and practical
- Late and irregular receipt of funds- a big impediment in implementing research work
- New partnership that has been established amongst the forest Department, lead institution, local Universities, NGOs and individual scientists should further be expanded in relevant fields of management importance such as conservation education, nature interpretation, ecotourism, ecological economics, etc

Co ordination mechanism:

- Synergy between workings of state, PA, and local level co ordination committees was found adequate
- However, the frequency of the co ordination committee meetings needs to be increased
- Currently, there is no representation of nodal agency for research in the research co ordination committee. Nodal agency therefore should find a place in the research committee for strengthening various research agenda of managerial importance
- Dove tailing various programs of line agencies in the buffer and transitional zone needs to be strengthened

Table 4*Number of forest offences during 2006-07 and 07-08 (up to September, 2007)*

Sl. No.	Division	Offence Record Cases	Undetected Cases	Total Cases	Cases detected by <i>Sabuja Vahini</i>	Fire incidences detected by <i>Sabuja Vahini</i>
1.	Tiger Project (Core of Simlipal BR)	34	69	103	27 (79.4)	2
2.	Karanjia	1352	255	1607	609 (45)	-
3.	Baripada	2079	1205	3284	31 (1.5)	-
4.	Rairangpur	997	213	1210	116 (11.6)	213
5.	Simlipal BR	4462	1742	6204	783 (12.6)	215

*Values in the parentheses refer to the % of total Offence Record cases***Table 5***Evaluation of conservation and management effectiveness of Simlipal Biosphere Reserve scheme*

Parameters	Score obtained
Attainment of objectives	8
Achievement of outputs and activities	8
Implementation approach and quality	8
Stakeholder participation	8
Livelihood and Community welfare	7
Education and Awareness generation	8
Research Management Interface	8
Inter-sectoral Coordination	7
Program Sustainability	8
Overall Score:	8

Level of Participation

Before the formation of local institutions such as VSS, EDC, SHG in the area, the communities were almost neglected. And because of institution building and subsequent capacity building programmes followed by implementation of the alternate employment generation schemes, the level of participation of local communities in the PA conservation initiatives have certainly increased. However, this may still fluctuate depending upon the level of communication between the local staff and the communities. The level of participation is still limited to four levels of participation such as participation by information giving, participation by consultations, participation for material incentives, and in some cases functional participation (Pimbert and Pretty, 1995). Therefore, much more needs to be done to enhance this passive level of participation to much higher level (active participation) in different conservation development initiatives of Simlipal.

Evaluation and Scoring

The success of planning and implementation of biosphere reserve scheme was rated on a 10 point scale ranging from 'highly unsatisfactory = 1' to 'highly satisfactory = 10'. Parameters such as attainment of objectives, achievements of outputs and activities, implementation approach and quality, stakeholder participation, livelihood and community welfare, education and awareness generation, research management interface, intersectoral coordination, and programme sustainability were considered for rating purpose. Each parameter was scored separately and finally, an overall rating of 8 was arrived at on the scale of 10 point (Table 5).

Recommendations

The major recommendations for achieving long term sustainability of this programme are described below:

Issues related to Site

- ▶ Continuity of dialogue between the PA staff and the local communities should become a routine job of the Biosphere Reserve management.
- ▶ Capacity building programme for the local communities should be intensified and extended in new pockets based on proper need assessment.
- ▶ Identify and train adequate number of community motivators for each village cluster to initiate, strengthen and further extend the conservation awareness programme for local communities.
- ▶ Local communities should be involved in more and more of habitat improvement and eco restoration works through existing institutions such as EDC and VSS.
- ▶ Attempts should be made to diversify the existing alternative livelihood opportunities.
- ▶ Special emphasis should be given for enterprise development around selected livelihood options, production of value added products, and finally establishing proper market linkages for long term sustainability.
- ▶ Efforts should also be initiated to minimize the time lag between conducting of a training programme and initiation of the actual enterprise development work so that the trained

villagers will not get frustrated due to the administrative delay and thus the very purpose of the programme will not be defeated.

- ▶ Strengthen dovetailing of programs of various line agencies in the buffer and transitional zone with that of the Biosphere Reserve scheme.

Issues related to State Government

- ▶ Frequency of the co ordination committee meetings needs to be increased.
- ▶ The new partnership between forest Department, lead institution, local Universities, NGOs and individual scientists with respect to formulating and facilitating research works should be expanded further in relevant fields of management importance such as conservation education, nature interpretation, ecotourism, and ecological economics of ecosystem goods and services.
- ▶ Ensure decentralized mechanisms of fund generation and management such as FDA approach and creation of some corporate fund in the line of Periyar Foundation.

- ▶ There is a need to explore other funding sources and alternate schemes for dovetailing with the Biosphere Reserve scheme.

Issues related to Central and State Government

- ▶ There is an urgent need of 5 year comprehensive planning using log frame approach and involving various stakeholders for the project site that can flow into the annual plans to ensure continuity of management inputs.
- ▶ A scientific perspective planning, adequate and sustained flow of funds and sound monitoring systems will go a long way in achieving the desired impact of the programme.

Issues related to Central Government

- ▶ Nodal agency for research must find a place in the research co ordination committee for strengthening various research agenda of managerial importance.
- ▶ In order to create a sustainable larger impact of this project, the next phase of the Biosphere Reserve scheme should be implemented in Simlipal without any break so that the continuity of efforts, already put in, can be ensured.

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SUMMARY

Similipal Biosphere Reserve of northern Orissa is one among the seven such reserves of India that form a part of the World Network of Biosphere Reserves. The overall objective of the Biosphere Reserve programme was to deal with one of the most important questions of reconciling conservation of

biodiversity, quest for economic and social development, and maintenance of associated cultural values. Simlipal has been regularly receiving financial assistance from the Ministry of Environment and Forests (MoEF, GoI) under centrally sponsored scheme. Using a host of participatory evaluation methods, conservation and management success of Biosphere Reserve scheme at Simlipal was evaluated. Major outputs as per the project objectives are improved protection, ecological restoration of degraded forests, sustainable utilization of natural resource, better employment opportunities for the local communities, increased conservation awareness, and improved research-management interface and PA-People relationship. The qualitative outputs have generated the overall atmosphere for stakeholder's participation, women empowerment and implementation of sustainable development initiatives in the villages of Simlipal Biosphere Reserve.

Key words: Simlipal Biosphere Reserve, Conservation, Management, Biodiversity, Protection, Ecological restoration and Natural resources.

सिमिलीपाल जीवमण्डल आरक्षित क्षेत्र, उड़ीसा, भारत के संरक्षण और प्रबन्धन की प्रभावकारिता

बी० के० मिश्र

सारांश

उत्तरी उड़ीसा का सिमिलीपाल जीवमण्डल आरक्षित क्षेत्र, भारत के उन सात ऐसे आरक्षित क्षेत्रों में से है जिन्हें जीवमण्डल आरक्षित क्षेत्रों के विश्व जालकर्म का अंग माना जाता है। समग्रतः जीवमण्डल आरक्षित क्षेत्र कार्यक्रम का सबसे महत्वपूर्ण उद्देश्य जैव विविधता संरक्षण के सर्वाधिक महत्वपूर्ण प्रश्नों में से एक की संगति बढ़ाने का विवेचन करना, आर्थिक और सामाजिक विकास को खोज करना तथा उनसे सम्बन्धित सांस्कृतिक मूल्यों को यथावत् बनाए रखना था। सिमिलीपाल को केन्द्र प्रायोजित योजना के अन्तर्गत नियमपूर्वक पर्यावरण व वन मन्त्रालय, भारत सरकार से वित्तीय सहायता प्राप्त होती रही है। प्रतिभागिता वाली मूल्यांकन की अनेक रीतियों को उपयोग में लाते हुए सिमिलीपाल में जीव मण्डल आरक्षित क्षेत्र योजना की संरक्षण में प्रबन्ध सफलता का मूल्यांकन किया गया है। परियोजना उद्देश्यों के अनुरूप इसके मुख्य लक्ष्य परिष्कृत सुरक्षा, व्याप्त वनों का परिस्थितिकीय पुनः संस्कार, प्राकृतिक संसाधनों का लम्बे समय तक टिकाऊ उपयोग, स्थानीय समुदायों के लिए ज्यादा अच्छे रोजगार पाने के अवसर, संरक्षण के प्रति ज्यादा जागरूकता, ज्यादा परिष्कृत अनुसंधान प्रबन्धन अंश तथा सुरक्षित क्षेत्र-जनता से सम्बन्ध रखे गए। गुणात्मक निवेशों से हितधारियों की प्रतिभागिता के लिए समग्र वातावरण महिला सशक्तिकरण तथा सिमिलीपाल जीवमण्डल आरक्षित क्षेत्र के अन्तर्गत पड़ते गांवों में दीर्घकाल तक टिकाऊ विकास उद्यम आरम्भ होना क्रियान्वित करने में सफलता मिली है।

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